

AMENDMENTS TO THE CLAIMS

This Listing of Claims will replace all prior versions and listings of claims in this application.

Listing of Claims:

Claims 1-60. (Cancelled).

Claims 61-70. (Cancelled).

71. (Withdrawn) A method for microbiological control of cooling water which comprises introducing into said cooling water a biocidally effective amount of an aqueous biocidal solution comprising at least 100,000 ppm (wt/wt) sulfamate stabilized halogen as measured as Br₂, wherein the content of sulfamate stabilized halogen is preparable by a method consisting of adding bromine chloride to an alkali metal sulfamate solution formed from water, sulfamic acid and alkali metal base, wherein the pH of said alkali metal sulfamate solution is maintained at about 13.0 or greater during bromine chloride addition, and wherein the molar ratio of sulfamic acid to bromine chloride is at least 0.93.

72. (Withdrawn) The method of claim 71, wherein the aqueous biocidal solution is introduced into said cooling water all at once.

73. (Withdrawn) The method of claim 71, wherein the aqueous biocidal solution is introduced into said cooling water slowly over time.

74. (Withdrawn) The method of claim 71, wherein the aqueous biocidal solution is introduced into said cooling water via an apparatus through which the cooling water is circulated.

75. (Withdrawn) The method of claim 71, wherein the molar ratio of sulfamic acid to bromine chloride is at least 1.0.

76. (Withdrawn) The method of claim 75, wherein the aqueous biocidal solution is introduced into said cooling water all at once.

77. (Withdrawn) The method of claim 75, wherein the aqueous biocidal solution is introduced into said cooling water slowly over time.

78. (Withdrawn) The method of claim 75, wherein the aqueous biocidal solution is introduced into said cooling water via an apparatus through which the cooling water is circulated.

79. (Withdrawn) The method of claim 75, wherein the aqueous biocidal solution comprises in the range of 120,000 to 180,000 ppm (wt/wt) sulfamate stabilized halogen as measured as Br_2 .

80. (Withdrawn) The method of claim 79, wherein the aqueous biocidal solution is introduced into said cooling water all at once.

81. (Withdrawn) The method of claim 79, wherein the aqueous biocidal solution is introduced into said cooling water slowly over time.

82. (Withdrawn) The method of claim 79, wherein the aqueous biocidal solution is introduced into said cooling water via an apparatus through which the cooling water is circulated.

83. (Withdrawn) The method of claim 75, wherein the molar ratio of sulfamic acid to bromine chloride is in the range of about 1.1 to about 1.5.

84. (Withdrawn) The method of claim 83, wherein the aqueous biocidal solution is introduced into said cooling water all at once.

85. (Withdrawn) The method of claim 83, wherein the aqueous biocidal solution is introduced into said cooling water slowly over time.

86. (Withdrawn) The method of claim 83, wherein the aqueous biocidal solution is introduced into said cooling water via an apparatus through which the cooling water is circulated.

87. (Withdrawn) The method of claim 83, wherein the aqueous biocidal solution comprises in the range of 120,000 to 180,000 ppm (wt/wt) sulfamate stabilized halogen as measured as Br_2 .

88. (Withdrawn) The method of claim 87, wherein the aqueous biocidal solution is introduced into said cooling water all at once.

89. (Withdrawn) The method of claim 87, wherein the aqueous biocidal solution is introduced into said cooling water slowly over time.

90. (Withdrawn) The method of claim 87, wherein the aqueous biocidal solution is introduced into said cooling water via an apparatus through which the cooling water is circulated.

91. (Withdrawn) A method for disinfecting a waste treatment system which comprises introducing into said waste treatment system a biocidally effective amount of an aqueous biocidal solution comprising at least 100,000 ppm (wt/wt) sulfamate stabilized

halogen as measured as Br₂, wherein the content of sulfamate stabilized halogen is preparable by a method consisting of adding bromine chloride to an alkali metal sulfamate solution formed from water, sulfamic acid and alkali metal base, wherein the pH of said alkali metal sulfamate solution is maintained at about 13.0 or greater during bromine chloride addition, and wherein the molar ratio of sulfamic acid to bromine chloride is at least 0.93.

92. (Withdrawn) The method of claim 91, wherein the molar ratio of sulfamic acid to bromine chloride is at least 1.0.

93. (Withdrawn) The method of claim 92, wherein the aqueous biocidal solution comprises in the range of 120,000 to 180,000 ppm (wt/wt) sulfamate stabilized halogen as measured as Br₂.

94. (Withdrawn) The method of claim 92, wherein the molar ratio of sulfamic acid to bromine chloride is in the range of about 1.1 to about 1.5.

95. (Withdrawn) The method of claim 94, wherein the aqueous biocidal solution comprises in the range of 120,000 to 180,000 ppm (wt/wt) sulfamate stabilized halogen as measured as Br₂.

96. (Withdrawn) A method for sanitizing a body of water which comprises introducing into said body of water a biocidally effective amount of an aqueous biocidal solution comprising at least 100,000 ppm (wt/wt) sulfamate stabilized halogen as measured as Br₂, wherein the content of sulfamate stabilized halogen is preparable by a method consisting of adding bromine chloride to an alkali metal sulfamate solution formed from water, sulfamic acid and alkali metal base, wherein the pH of said alkali metal sulfamate solution is maintained at about 13.0 or greater during bromine chloride addition, and wherein the molar ratio of sulfamic acid to bromine chloride is at least 0.93.

97. (Withdrawn) The method of claim 96, wherein the aqueous biocidal solution is introduced into said body of water all at once.

98. (Withdrawn) The method of claim 96, wherein the aqueous biocidal solution is introduced into said body of water slowly over time.

99. (Withdrawn) The method of claim 96, wherein the aqueous biocidal solution is introduced into said body of water via an apparatus through which the body of water is circulated.

100. (Withdrawn) The method of claim 96, wherein the molar ratio of sulfamic acid to bromine chloride is at least 1.0.

101. (Withdrawn) The method of claim 100, wherein the aqueous biocidal solution is introduced into said body of water all at once.

102. (Withdrawn) The method of claim 100, wherein the aqueous biocidal solution is introduced into said body of water slowly over time.

103. (Withdrawn) The method of claim 100, wherein the aqueous biocidal solution is introduced into said body of water via an apparatus through which the body of water is circulated.

104. (Withdrawn) The method of claim 100, wherein the aqueous biocidal solution comprises in the range of 120,000 to 180,000 ppm (wt/wt) sulfamate stabilized halogen as measured as Br₂.

105. (Withdrawn) The method of claim 104, wherein the aqueous biocidal solution is introduced into said body of water all at once.

106. (Withdrawn) The method of claim 104, wherein the aqueous biocidal solution is introduced into said body of water slowly over time.

107. (Withdrawn) The method of claim 104, wherein the aqueous biocidal solution is introduced into said body of water via an apparatus through which the body of water is circulated.

108. (Withdrawn) The method of claim 100, wherein the molar ratio of sulfamic acid to bromine chloride is in the range of about 1.1 to about 1.5.

109. (Withdrawn) The method of claim 108, wherein the aqueous biocidal solution is introduced into said body of water all at once.

110. (Withdrawn) The method of claim 108, wherein the aqueous biocidal solution is introduced into said body of water slowly over time.

111. (Withdrawn) The method of claim 108, wherein the aqueous biocidal solution is introduced into said body of water via an apparatus through which the body of water is circulated.

112. (Withdrawn) The method of claim 108, wherein the aqueous biocidal solution comprises in the range of 120,000 to 180,000 ppm (wt/wt) sulfamate stabilized halogen as measured as Br₂.

113. (Withdrawn) The method of claim 112, wherein the aqueous biocidal solution is introduced into said body of water all at once.

114. (Withdrawn) The method of claim 112, wherein the aqueous biocidal solution is introduced into said body of water slowly over time.

115. (Withdrawn) The method of claim 112, wherein the aqueous biocidal solution is introduced into said body of water via an apparatus through which the body of water is circulated.

116. (Withdrawn) A method for microbiological control of cooling water which comprises introducing into said cooling water a biocidally effective amount of an aqueous biocidal solution comprising at least 100,000 ppm (wt/wt) sulfamate stabilized halogen as measured as Br₂, wherein the content of sulfamate stabilized halogen is prepared by a method consisting of adding bromine chloride to an alkali metal sulfamate solution formed from water, sulfamic acid and alkali metal base, wherein the pH of said alkali metal sulfamate solution is maintained at about 13.0 or greater during bromine chloride addition, and wherein the molar ratio of sulfamic acid to bromine chloride is at least 0.93.

117. (Withdrawn) The method of claim 116, wherein the molar ratio of sulfamic acid to bromine chloride is at least 1.0.

118. (Withdrawn) The method of claim 117, wherein the aqueous biocidal solution comprises in the range of 120,000 to 180,000 ppm (wt/wt) sulfamate stabilized halogen as measured as Br₂.

119. (Withdrawn) The method of claim 117, wherein the molar ratio of sulfamic acid to bromine chloride is in the range of about 1.1 to about 1.5.

120. (Withdrawn) The method of claim 119, wherein the aqueous biocidal solution comprises in the range of 120,000 to 180,000 ppm (wt/wt) sulfamate stabilized halogen as measured as Br₂.

121. (Withdrawn) A method for disinfecting a waste treatment system which comprises introducing into said waste treatment system a biocidally effective amount of an aqueous biocidal solution comprising at least 100,000 ppm (wt/wt) sulfamate stabilized halogen as measured as Br₂, wherein the content of sulfamate stabilized halogen is prepared by a method consisting of adding bromine chloride to an alkali metal sulfamate solution formed from water, sulfamic acid and alkali metal base, wherein the pH of said alkali metal sulfamate solution is maintained at about 13.0 or greater during bromine chloride addition, and wherein the molar ratio of sulfamic acid to bromine chloride is at least 0.93.

122. (Withdrawn) The method of claim 121, wherein the molar ratio of sulfamic acid to bromine chloride is at least 1.0.

123. (Withdrawn) The method of claim 122, wherein the aqueous biocidal solution comprises in the range of 120,000 to 180,000 ppm (wt/wt) sulfamate stabilized halogen as measured as Br_2 .

124. (Withdrawn) The method of claim 122, wherein the molar ratio of sulfamic acid to bromine chloride is in the range of about 1.1 to about 1.5.

125. (Withdrawn) The method of claim 124, wherein the aqueous biocidal solution comprises in the range of 120,000 to 180,000 ppm (wt/wt) sulfamate stabilized halogen as measured as Br_2 .

126. (Withdrawn) A method for sanitizing a body of water which comprises introducing into said body of water a biocidally effective amount of an aqueous biocidal solution comprising at least 100,000 ppm (wt/wt) sulfamate stabilized halogen as measured as Br_2 , wherein the content of sulfamate stabilized halogen is prepared by a method consisting of adding bromine chloride to an alkali metal sulfamate solution formed from water, sulfamic acid and alkali metal base, wherein the pH of said alkali metal sulfamate solution is maintained at about 13.0 or greater during bromine chloride addition, and wherein the molar ratio of sulfamic acid to bromine chloride is at least 0.93.

127. (Withdrawn) The method of claim 126, wherein the molar ratio of sulfamic acid to bromine chloride is at least 1.0.

128. (Withdrawn) The method of claim 127, wherein the aqueous biocidal solution comprises in the range of 120,000 to 180,000 ppm (wt/wt) sulfamate stabilized halogen as measured as Br_2 .

129. (Withdrawn) The method of claim 127, wherein the molar ratio of sulfamic acid to bromine chloride is in the range of about 1.1 to about 1.5.

130. (Withdrawn) The method of claim 129, wherein the aqueous biocidal solution comprises in the range of 120,000 to 180,000 ppm (wt/wt) sulfamate stabilized halogen as measured as Br_2 .

131. (New) A process of producing a concentrated, stabilized liquid biocide formulation which consists of the step of preparing the concentrated stabilized liquid biocide formulation by the step consisting of cofeeding to a reactor containing an aqueous solution formed from water, sulfamic acid and alkali metal base, (i) bromine and (ii) a solution of alkali metal base that maintains the pH of said concentrated, stabilized liquid biocide formulation produced in the reactor in the range of from about 12 to about 14.

132. (New) A process according to claim 131 wherein said concentrated, stabilized liquid biocide formulation prepared in said step contains an amount of bromine that is no more than 26% of active bromine.

133. (New) A process according to claim 131 wherein said biocide formulation has an active bromine content of at least about 100,000 (wt/wt) and an atom ratio of nitrogen to active bromine greater than 1.

134. (New) A process according to claim 131, wherein the pH is up to about 13.5.

135. (New) A process of producing a concentrated liquid biocide composition, which process comprises

- A) continuously feeding into mixing apparatus (i) bromine and (ii) an aqueous solution of alkali metal salt of sulfamic acid having a pH of at least about 12, proportioned to produce an aqueous product having an active bromine content of at least 100,000 ppm (wt/wt), and an atom ratio of nitrogen to active bromine from (i) and (ii) greater than 1, and
- B) withdrawing said product from said mixing apparatus at a rate sufficient to enable the continuous feeding in A) to be maintained.

136. (New) A process according to Claim 135 wherein (ii) in A) is an aqueous solution of the sodium salt of sulfamic acid.

137. (New) A process according to Claim 136 wherein said atom ratio is in the range of about 1.1 to about 1.5.

138. (New) A process according to Claim 135 wherein said mixing apparatus comprises a static mixer.

139. (New) A process according to Claim 135 wherein said mixing apparatus comprises a vessel equipped with a mechanical stirrer.

140. (New) A process according to Claim 139 wherein said product is intermittently withdrawn from said vessel.

141. (New) A process according to Claim 139 wherein said product is continuously withdrawn from said vessel.

142. (New) A process of producing a concentrated liquid biocide composition, which process comprises

- A) continuously feeding into mixing apparatus (i) a bromine stream and (ii) a separate feed stream of an aqueous solution of alkali metal salt of sulfamic acid having a pH of at least about 12, in proportions that produce an aqueous product having an active bromine content of at least 100,000 ppm (wt/wt), and an atom ratio of nitrogen to active bromine from (i) and (ii) greater than 1, and
- B) withdrawing said product from said mixing apparatus at a rate sufficient to enable the continuous feeding in A) to be maintained; and
- C) continuously, but alternately, withdrawing from at least one and then from at least one other of at least two reaction vessels, an aqueous solution of alkali metal salt of sulfamic acid at a rate that maintains said stream of (ii) in A), and during the time the solution is being withdrawn from said at least one of at least two reaction vessels, forming additional aqueous solution of alkali metal salt of sulfamic acid in said at least one other of at least two reaction vessels from which solution is not then being withdrawn.

143. (New) A process according to Claim 142 wherein said aqueous solution of alkali metal salt of sulfamic acid is an aqueous solution of the sodium salt of sulfamic acid.

144. (New) A process according to Claim 142 wherein said aqueous solution of alkali metal wherein said atom ratio is in the range of about 1.1 to about 1.5.

145. (New) A process according to Claim 142 wherein said mixing apparatus comprises a static mixer.

146. (New) A process according to any of Claim 142 wherein said mixing apparatus comprises a vessel equipped with a mechanical stirrer.

147. (New) A process according to Claim 146 wherein in B) said aqueous product is intermittently withdrawn from said vessel.

148. (New) A process according to Claim 146 wherein in B) said aqueous product is continuously withdrawn from said vessel.

149. (New) A process according to Claim 142 wherein said mixing apparatus comprises a static mixer, and wherein said additional aqueous solution of alkali metal salt of sulfamic acid is formed from an alkali metal base, sulfamic acid, and water.

150. (New) A process according to Claim 142 wherein said mixing apparatus comprises a static mixer, wherein said aqueous solution of alkali metal salt of sulfamic acid is an

aqueous solution of sodium sulfamate, and wherein said additional aqueous solution of alkali metal salt of sulfamic acid is formed from a water-soluble sodium base, sulfamic acid, and water.

151. (New) A process according to Claim 150 wherein said sodium base is an aqueous solution of sodium hydroxide, and wherein the sodium sulfamate is formed as an aqueous solution by charging to a reactor (i) an aqueous solution of sodium hydroxide, and (ii) a slurry of sulfamic acid in water, or (iii) separate charges of sulfamic acid and water, or (iv) both of (ii) and (iii).